

Update of the Status of IEEE 1547.8, Expanding on IEEE Standard 1547

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WHO IS DOING THIS?

- ✗ Utilities
- ✗ Inverter & equipment manufacturers
- ✗ Government agencies
- ✗ Underwriter Labs (UL)
- ✗ Utility commission representatives
- ✗ Academics

IEEE 1547 SERIES OF STANDARDS

- × 1547, the Interconnection standard
- × 1547.1, testing requirements
- × 1547.2, application guide
- × 1547.3, communications requirements
- × 1547.4, Intentional Islands
- × 1547.6, Connection to low voltage networks
- × 1547.7, studies
- × 1547.8, expanded use of 1547

WHAT THE DOCUMENT PROVIDES

- ✖ Concentrates on the effects beyond the PCC, Point of Common Coupling
- ✖ Voltage and frequency concerns
- ✖ Impacts
- ✖ High penetration
- ✖ Examples of applications

WHAT DOES THIS MEAN TO YOU?

- ✖ Better understanding of the interactions of DR (Distributed Resource) and the grid
- ✖ Guidance for the increased use of DR
- ✖ Guidance for the use of ‘smart’ inverters
- ✖ Guidance for the integration of DR with the ‘smart grid’

4.1.1 VOLTAGE REGULATION

- ✗ Review to provide more flexibility in application of DR
- ✗ Impacts on existing regulation devices
- ✗ Intermittent operation of DR
- ✗ Reactive power control
- ✗ Uses for voltage regulation
- ✗ Coordination of devices and DR
- ✗ Coordination with CVR (Conservation Voltage Reduction)

4.1.2 INTEGRATION WITH AREA EPS GROUNDING

- ✖ TOV (Temporary Over Voltage)
- ✖ Grounding transformers
- ✖ Grounding switches
- ✖ Direct Transfer Trip (DTT)

4.1.4 SYNCHRONIZATION

- ✗ No changes were recommended

4.1.5 SECONDARY GRID OR SPOT NETWORKS

- ✘ No changes were recommended

4.1.6 INADVERTENT ENERGIZATION OF THE AREA EPS

- ✘ See IEEE 1547.4 for guidance on Intentional Islands.

4.1.7 MONITORING PROVISIONS

- ✕ A new section 6 has been added
 - + Types of communication
 - + Analog and status monitoring
 - + Emergency actions
 - + Autonomous modes
 - + Direct management
 - + Default actions or operation

4.1.8 ISOLATION DEVICE

- ✕ Minor changes being discussed

4.1.9 INTERCONNECT INTEGRITY

- ✗ No recommended changes

4.2 RESPONSE TO AREA EPS ABNORMAL CONDITIONS

- ✖ Initial discussions about alternatives to the prescribed voltage and frequency trips
- ✖ Review line protection versus unintentional-island
- ✖ Protection options
- ✖ Grounding options
- ✖ Sags and Swells
- ✖ Using DR for mitigation

AREA EPS FAULTS

- ✖ Alternate relays
- ✖ Sequential tripping
- ✖ DTT (Direct Transfer Trip)
- ✖ Combinations of approaches

4.2.2 AREA EPS RECLOSING COORDINATION

- ✖ Extend Area EPS reclosing delay
- ✖ Shorten the DR anti-islanding trip time
- ✖ Voltage block on reclosing (load side)

4.2.3 VOLTAGE

- ✖ Some additional clarification on voltage detection
- ✖ Coordination of settings with LVRT (Low Voltage Ride Through)

4.2.4 FREQUENCY

- ✖ Some discussion with frequency settings, specifically low frequency settings and coordination with the AREA EPS load shedding

OTHER SECTIONS

+ 4.2.5 *Loss of Synchronism*

✗ No recommendations made

+ 4.2.6 *Reconnection to Area EPS*

✗ No recommendations made

+ 4.3 *Power Quality*

✗ No recommendations made

+ 4.3.2 *Limitation of Flicker*

✗ No recommendations made

4.3.3 HARMONICS

- ✕ Some minor additional clarifications

4.4.1 UNINTENTIONAL ISLANDING

- ✗ DR limited to $1/3$ of the minimum circuit segment load
- ✗ Coordination of voltage and frequency trips
- ✗ Reverse power flow
- ✗ DTT (Direct Transfer trip)
- ✗ Advanced methods (phasor monitoring, communication signal from Area EPS)

INTENTIONAL ISLANDS

✕ Refer to IEEE 1547.4-2011

INTERCONNECTION TEST SPECIFICATIONS AND REQUIREMENTS

- ✘ No changes were made initially, however depending on the proposed recommendations of the previous sections, additional tests or alterations of existing test will be added.

NEW SECTION MONITORING AND CONTROL

- ✘ Discussion on high penetration levels
- ✘ Situational awareness of the DR
- ✘ Various levels of communication may be required
- ✘ Autonomous mode operation
- ✘ Use cases for the data and control functions
- ✘ Data exchange
- ✘ Direct Area EPS control

GROUP BEHAVIOR OF DR

- ✖ Discussion of group impacts
- ✖ Reliability improvement
- ✖ Characteristics of DR
- ✖ Coordination of Groups of DR
- ✖ Power quality improvements
- ✖ Conservation Voltage reduction
- ✖ Incremental Bulk System Capacity

ADDITIONAL ITEMS BEING REVIEWED

- ✖ Ancillary Services
- ✖ Reduced Congestion
- ✖ Emissions reductions
- ✖ Load relief
- ✖ Ride through

QUESTIONS

- ✖ Next Meeting February, 2013
- ✖ Co-located with P2030.2, IEEE 1547.7
- ✖ If interested in joining or contributing:
- ✖ http://grouper.ieee.org/groups/scc21/1547.8/1547.8_logistics.html